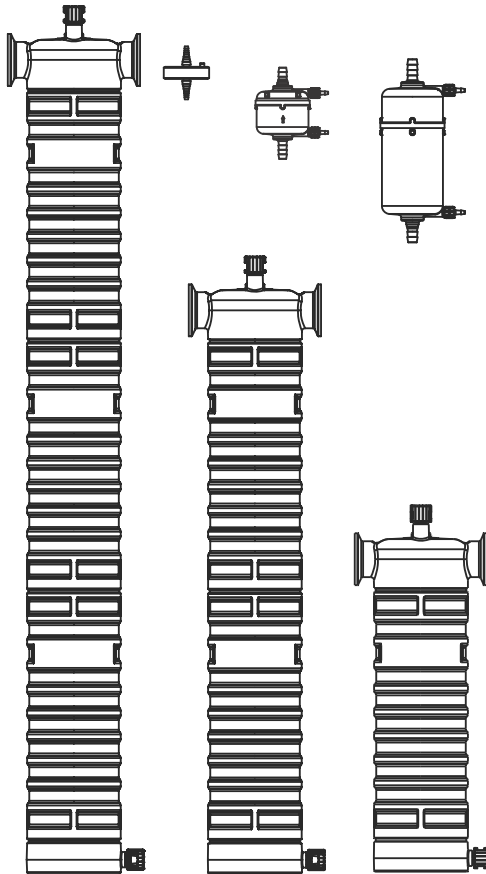


# MicroCap Single-Use Capsules User Guide



# Introduction

MicroCap™ single-use capsules are designed for liquid clarification and prefiltration applications. They are available with several formulations of depth filter media, each consisting of several grades with different permeabilities or adsorptive properties:

- MicroMedia®, XL, and DXL formulations incorporate a strong zeta-potential (positive charge) to remove negatively charged particles smaller than the pores of the filter media.
- MicroClear™ formulations incorporate adsorptive activated carbon to remove colors and odors.

The procedures in this User Guide contain information about the installation of MicroCap single-use capsules and detail requirements that must be read thoroughly. Where appropriate, these instructions should be incorporated into the user's standard operating procedures. If procedures do not suit your needs, please consult ErtelAlsop or your local distributor before finalizing your system.



*Caution: Using this product in a manner different than currently recommended by ErtelAlsop may lead to injury or product loss. ErtelAlsop cannot accept liability for such injury or loss.*

## Receipt of Equipment

1. Store the filter assembly in clean, dry conditions between 0 °C (32 °F) and 30 °C. (86 °F) in its original packaging. Do not expose to direct sunlight.
2. Ensure that the selected capsule is suitable for the application.



In addition to the part number, each filter assembly is identified by a lot number.

3. Check the packaging for damage.

Remove the capsule from its packaging only immediately before installation..



*Caution: For clean room applications, the box and first outer bag should be removed before entering cleanroom. The second bag should be removed immediately before installation.*

Shelf life data for various filter media used in MicroCap capsules is available. Please request details from ErtelAlsop.

# Preparation

1. Check that the selected capsule is appropriate for the process and product to be filtered and follow the instructions detailed in this document.
2. Provide adequate support for the capsule.
3. Ensure that it is oriented correctly for flow from inlet to outlet.



*Caution: Process fluids must flow in the direction of the arrow on the filter assembly. Do not use MicroCap Capsules for reverse-flow applications.*

4. Remove any protective plastic caps from valves and inlet/outlet connectors prior to use.



Liquid filter capsule assemblies can be positioned in any orientation if effective filter venting can be implemented before and maintained during operation

5. Install the capsule in-line using compatible connections.
6. If a positive pressure exists downstream of the capsule assembly, a check valve or equivalent installation will be required to prevent reverse flow damage.
7. When pulsating flow is present, the capsule assembly should be protected by an upstream surge tank or similar device between the valve and filter.
8. Depending on the application, a cold or warm water rinse in a forward flow direction is recommended before use.



In special cases rinsing can be performed with product or a product-compatible liquid.

9. The recommended rinsing volume is 50 L/m<sup>2</sup> of filter area for single-layer capsules and 100 L/m<sup>2</sup> and for double-layer capsules. If unsure of suitable flushing procedures, contact ErtelAlsop.

## Use for Liquid Applications

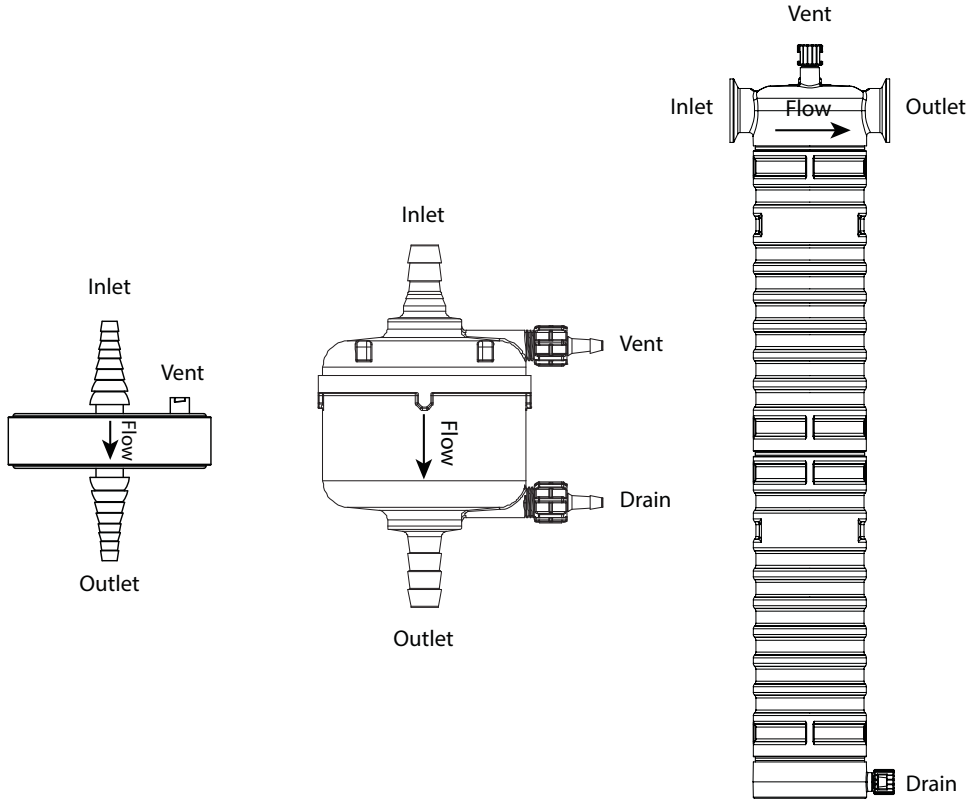
1. Attach tubing to the inlet:
  - For hose barb connections, secure the tubing with a suitable fastener.
  - For a sanitary connection, install the gasket and tighten the clamp.
2. Loosen the vent valve to allow flow.
3. Slowly fill the capsule. Rotate the valve clockwise to tighten the vent as soon as liquid reaches the level of the vent and all excess air has escaped the assembly.
4. Gradually increase the flow rate or pressure to the desired value.



*Caution: Do not exceed the maximum operating parameters listed in the product specifications*

5. When filtration is complete, purge fluid with air from the inlet or vent port to minimize the holdup of fluid in the assembly.
6. To further increase recovery of product, an appropriate liquid (i.e., buffer) can be used to rinse remaining product hold-up from filter media prior to using an air purge

**Figure 1: Typical Capsule Setup<sup>[1]</sup>**



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1. The drawings in Figure 1 are representations of typical MicroCap capsules. For specific details on the MC1, MC2, MC5, MC10, MC20, and MC30 capsules, see Document No. B10001, *MicroCap Depth Filter Capsules*.

# Specifications

**Table 1: Sterilization — Autoclave**

<b>MC1</b>	1 cycle @ 121 °C for 30 minutes
<b>MC2, MC5, MC10, MC20, MC30</b>	2 cycles @ 125 °C for 60 minutes



*Caution: Do not in-line steam sterilize MicroCap Capsules.*

**Table 2: Effective Filtration Area**

	<b>Single Layer (cm<sup>2</sup>)</b>	<b>Double Layer (cm<sup>2</sup>)</b>
<b>MC1</b>	23	23
<b>MC2</b>	170	80
<b>MC5</b>	330	170
<b>MC10</b>	960	500
<b>MC20</b>	1920	1000
<b>MC30</b>	2880	1500

**Table 3: Maximum Operating Pressure**

<b>MC1</b>	2.5 barg (36 psig) @ 22 °C
<b>MC2, MC5, MC10, MC20, MC30</b>	5.5 barg (80 psig) @ 22 °C

**Table 4: Maximum Differential Pressure**

<b>MC1</b>	2 bard (30 psid)
<b>MC2, MC5, MC10, MC20, MC30</b>	2.4 bard (35 psid)

**Table 5: Inlet and Outlets**

<b>MC1*</b>	¼ in. – ⅜ in. Hose Barb
<b>MC2, MC5</b>	⅜ in. Hose Barb or ½ in. Sanitary Clamp
<b>MC10, MC20, MC30</b>	1½ in. Sanitary Clamp

\*Female Slip Luer to accept 4 – 9.5 mm ID tubing or male slip luer fitting.

## EC Directive 94/9/EC (ATEX) Compliance

This ATEX directive covers equipment and protective systems intended for use in a potentially explosive atmosphere. All equipment must be installed and maintained according to national guidelines and local codes and must adhere to all environmental regulations and Health and Safety directives.

ErtelAlsop capsule assemblies do not generate heat, but during high-temperature fluid processing, heat can be transferred from process fluid. Ensure that processing temperatures remain within the limits for safe use in the area where the filter is installed and operated.

MicroCap Capsules should not be used with low conductivity fluids in an environment with flammable liquids or in a potentially explosive atmosphere. The static electricity generated during use with polymeric components can lead to ignition.

Do not expose flammable fluids to temperatures that may cause ignition, and avoid having reactive fluids contact surfaces that may generate heat.

Leakage of flammable or reactive fluids because of incorrect installation or equipment damage may cause ignition if flammable fluids are exposed to a heated surface or if reactive fluids contact incompatible materials.

When flammable or reactive fluids are processed through a capsule assembly, direct fluids to a safe area.

Carefully vent assemblies and systems. When processing flammable fluids, air should be completely purged from the assembly during filling and operation to prevent the accumulation of flammable or explosive mixtures inside the equipment.

Protect components from mechanical damage. Inspect the assembly regularly for damage and leaks. To prevent capsule damage, check all materials of construction with process fluid under operating conditions. Repairs should be performed regularly and seals should be renewed with every capsule change. Please contact your local ErtelAlsop office or distributor with any questions.

# Replacement and Accessories

Contact ErtelAlsop or your local distributor for details and assistance related to fittings and configurations for the MicroCap Capsule system.

MicroCap Capsule assemblies should be replaced in conformance with GMP process requirements. When capsule assemblies are used for multiple batches, replacements are recommended when the maximum allowable differential pressure has been reached. If the flow rate is excessive or has been compromised, or if the cumulative steam life has been reached, whichever occurs first, discard the capsule assembly in accordance with local Health and Safety and Environmental procedures. Do not clean disposable capsule assemblies.

## Technical Assistance

ErtelAlsop and our international network of distribution partners can assist your scale-up from process to pilot or full scale. ErtelAlsop provides technical services to assist in the use of all filter products. This service is readily available to serve you. Technical support is available to optimize your processing.

### ErtelAlsop

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